

REMARKS

Favorable consideration and allowance of the claims of the present application are respectfully requested.

Before addressing the issues raised in the present Office Action, applicants have amended Claim 1 to positively recite that the step of forming Ni/Au metallization includes electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. Support for this amendment to Claim 1 is found in original Claim 7 which claim has been cancelled herein. Applicants have also added new Claims 21 and 22. Newly added Claim 21, which is dependent on Claim 1, adds the feature of bonding a wire to the Ni/Au metallization formed in Claim 1. Support for this newly added claim is found at paragraph 0002 of the originally filed specification. Additionally, applicants have added a new independent claim, i.e., Claim 22 which is based on original Claim 1 and paragraph 0002 of the originally filed specification.

Since the above amendments to the claims do not introduce new matter into the specification of the instant application, entry thereof is respectfully requested.

With regard to the present Office Action, the Examiner has requested that a new title be used which is descriptive of the presently claimed subject matter. In response to this informal objection to the title of the present application, applicants have amended the title appearing at Pages 1 and 18 using the language as suggested by the Examiner in the present Office Action. The new title is believed to be more descriptive of the presently claimed subject matter.

In addition to requesting a new title, the Examiner has rejected Claims 1-6, 8, 11 and 12 under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 6,451,681 to Greer ("Greer"). Claims 7 and 9 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable

over the combined disclosures of Greer, U.S. Patent No. 4,696,098 to Yen ("Yen) and U.S. Patent No. 6,548,327 to De Pauw, et al. ("De Pauw, et al."). Claim 10 stands rejected under 35 U.S.C. § 103 as allegedly unpatentable over the combined disclosures of Greer, De Pauw, et al. and U.S. Patent No. 6,174,823 to Dobson, et al. ("Dobson, et al.").

Concerning the § 102(b) rejection, it is axiomatic that anticipation under §102 requires that the prior art reference disclose each and every element of the claim to which it is applied. In re King, 801 F.2d, 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1996). Thus, there must be no differences between the subject matter of the claim and the disclosure of the prior art reference. Stated another way, the reference must contain within its four corners adequate direction to practice the invention as claimed. The corollary of the rule is equally applicable: Absence from the applied reference of any claimed element negates anticipation. Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

Applicants respectfully submit that the method recited in Claims 1-6, 8, 11 and 12 is not anticipated by Greer since the applied reference does not disclose a method in which the *Ni/Au metallization is formed by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au*. Greer provides a method for forming semiconductor devices having copper-containing interconnects. In one embodiment of Greer, a pad limiting metal layer 314 which comprises three conductive films 304, 306, and 308 is used and it is formed atop a portion of the bond pad 128. The pad limiting metal (PLM) layer 314 is reported to include Cr (as layer 304), Cu (as layer 306) and Au (as layer 308). Other combinations of films such as a composite of Ti, Cu, and Au, or a composite of Ti, Ni, Cu and Au are also contemplated by Greer. In accordance with the disclosure of Greer, the PLM layer 314 is formed by evaporation using a shadow mask. Alternatively, sputtering or plating can be used. The foregoing embodiment is illustrated in FIG. 3 of Greer. In an alternative embodiment

shown in FIGS. 5 and 6, a transition metallurgy structure 508 is formed and it can be used with PLM layer 608. Applicants observe that the layer 608 can be comprised of the same materials as the PLM layer 314 and similar processing can be used in forming the same.

Applicants respectfully submit that Greer does not disclose forming Ni/Au metallization by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. Applicants observe first of all that Greer does not disclose the specific combination of Ni and Au as presently recited in the claims. Instead, Greer discloses a composite including Ti, Ni, Cu and Au; no further combination of Ni and Au is mentioned in Greer. Second, Greer does not disclose the processing steps used in the claimed invention for forming the Ni/Au metallization, i.e., electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. Applicants note that the specific sequence of electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au added to Claim 1 was found in original Claim 7 and that original Claim 7 was not part of the anticipation rejection.

The foregoing remarks clearly demonstrate that the applied reference does not teach each and every aspect of the claimed invention, as required by King and Kloster Speedsteel; therefore the claims of the present application are not anticipated by the disclosure of Greer. Applicants respectfully submit that the instant § 102 rejection has been obviated and withdrawal thereof is respectfully requested.

In regard to the obviousness rejections citing the combination of Greer, Yen and De Pauw, et al. or the combination of Greer, De Pauw, et al. and Dodson, et al., applicants submit that the claims of the present invention are not rendered unpatentable by the disclosures of any of the references cited in the aforementioned combinations.

The principal reference spurring each of the obviousness rejections, i.e., Greer, is defective since that applied reference does not teach or suggest the claimed method where Ni/Au metallization is formed by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. Applicants observe that the above comments made under the anticipation rejection for Greer are equally applicable here for the obviousness rejections thus those remarks are incorporated herein by reference.

Yen does not alleviate the above defects in Greer since that applied secondary reference also does not teach or suggest the claimed method where Ni/Au metallization is formed by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. Yen discloses an improved process for forming one or more metal strips on an integrated circuit structure by wet etching of a metal layer. Specifically, the prior art method disclosed in Yen includes the steps of forming an intermediate layer over the integrated circuit structure; forming slots in the intermediate layer; and wet etching the metal layer sufficiently to remove all metal in the slots while retaining metal between the slots to form the desired one or more metal strips. At Col. 3, lines 39-42, a list of metals is provided. This list includes Al, Pt, Au, Ti, W and Mo. Yen does not disclose the specific combination of Ni and Au, let alone that such layers are formed by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au.

De Pauw, et al. do not alleviate the above defects in Greer and Yen since that applied secondary reference also does not teach or suggest the claimed method where Ni/Au metallization is formed by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. De Pauw, et al. disclose a method for electroless plating of Ni/Au on Al bonding pads. In De Pauw, et al., the electroless plating process includes

electroless Ni deposition and immersion of Au. The applied reference does not teach or suggest a step where electroless plating of Au follows the immersion Au step.

Dobson, et al. do not alleviate the above defects in Greer and De Pauw, et al. since that applied secondary reference also does not teach or suggest the claimed method where Ni/Au metallization is formed by electroless deposition of Ni, immersion deposition of Au and electroless deposition of Au. Dobson, et al. provide methods of forming a barrier layer including depositing a TiNi layer and subsequently nitriding the surface of that layer. In some embodiments, an optional oxygen exposure step may be performed prior to nitriding. The applied reference does not teach or suggest applicants' claimed process of forming a Ni/Au metallization layer which includes electroless deposition of Ni, immersion in Au and electroless plating of Au.

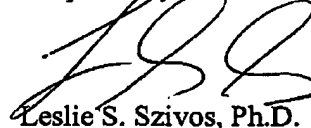
Applicants respectfully submit that the above amendments and remarks establish that the claims of the present application are not rendered obvious by the combined disclosures of Greer, Yen and De Pauw, et al or by the combined disclosures of Greer, De Pauw, et al. and Dobson, et al.

The various § 103 rejections also fail because there is no motivation in the applied references which suggest modifying the disclosed method to include the processing steps used in forming the Ni/Au metallization layer. Thus, there is no motivation provided in the applied references, or otherwise of record, to make the modification mentioned above. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Vaeck, 947 F.2d, 488, 493, 20 USPQ 2d. 1438, 1442 (Fed.Cir. 1991).

The rejections under 35 U.S.C. § 103 have been obviated; therefore reconsideration and withdrawal thereof is respectfully requested.

Thus, in view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



Leslie S. Szivos, Ph.D.
Registration No. 39,394

SCULLY, SCOTT, MURPHY & PRESSER
400 Garden City Plaza Suite 300
Garden City, New York 11530
(516) 742-4343
Customer No. 23389
LSS/jw